

Date: Thursday, 5/31/2007 7:23:16 AM  
User: Kim Johnston

# Process Sheet

POSITIVE RECALL

EFFECTIVE 07/06/07 AUTH W

DATE 07/06/07

Customer : CU-DAR001 Dart Helicopters Services  
Job Number : 32718-1  
Estimate Number : 12576  
P.O. Number : N/A  
This Issue : 5/31/2007 S.O. No. : N/A  
Prsht Rev. : NC  
First Issue : N/A Type : LARGE FAB ASSY  
Previous Run : 29411  
Written By : [Signature]  
Checked & Approved By : [Signature] 07.05.31  
Comment : Est Rev:A New Issue 06-11-09 JLM

Drawing Name : STEP WELDMENT  
Part Number : D3562041  
Drawing Number : D3562 UNDER REVIEW  
Project Number : N/A  
Drawing Revision : A  
Material : N/A  
Due Date : 6/11/2007  
Qty: 4 Um: Each

## Additional Product

Job Number:



Seq. #: Machine Or Operation: Description :

1.0 D2622120C Extrusion



Comment: Qty.: 1.0000 Each(s)/Unit Total : 5.0000 Each(s)  
Qty Part # Description Batch:  
1 D2622-120C Extrusion B31984

Check Material for any Dents or Defects

[Signature] 07.06.07

2.0 D2734 206 Step Endplate



Comment: Qty.: 2.0000 Each(s)/Unit Total : 10.0000 Each(s)  
Pick:  
Qty Part Number Description Batch  
2 D2734 End Cap B29340=1  
B30883=9

[Signature] 07.06.07

3.0 LARGE FAB 1 LARGE FABRICATION RESOURCE 1



Comment: LARGE FABRICATION RESOURCE 1

1-Cut D2622 extrusion as per Dwg D3562

[Signature] 07/06/07

(5)

2-Deburr and bevel ends for welding

[Signature] 07.06.07



[Signature] 07.06.07

3-Weld (1)end cap as per Dwg D3562& QSI 004. Inspect for foreign objects as per QSI 024.

A/R Aluminum Rod m102756

4-Grind end cap welds flush as per Dwg D3562

[Signature] 07.06.07

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector
07.06.07	11	Remove qty(2) MS20600AD4W RIVETS TOTAL Qty NOW 34 REF. MARKED-UP DWG & DS EMAIL.				 07.06.07 PC 081042	 07.06.07

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries



Date: Thursday, 5/31/2007 7:23:16 AM

User: Kim Johnston

## Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: STEP WELDMENT

Job Number: 32718

Part Number: D3562041

Job Number:



Seq. #:

Machine Or Operation:

Description:

4.0

QC5

INSPECT WORK TO CURRENT STEP



QCS

20706-07 (5)



Comment: INSPECT WORK TO CURRENT STEP

QC9 07/06/07 (5)

5.0

SMALL FAB 1

SMALL &amp; MEDIUM FAB RESOURCE 1



Comment: SMALL &amp; MEDIUM FAB RESOURCE 1

Drill Rivet holes as per dwg D3562. USING DT 8956

debur  
& Touch  
up Holes  
with  
Alodine  
w/AC

6.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

7.0

HAND FINISHING1

HAND FINISHING RESOURCE #1



Comment: HAND FINISHING RESOURCE #1

Chemical Conversion Coat as per QSI 005 4.1

FF 07-06-07

8.0

QC3

INSPECT POWDER COAT/CHEMICAL CONVERSION



Comment: INSPECT POWDER COAT/CHEMICAL CONVERSION

SB 07/06/07 (5)

9.0

D3560041

ARM WELDMENT



Comment: Qty.: 1.0000 Each(s)/Unit Total: 5.0000 Each(s)

ARM WELDMENT

B32443

FF 07-06-07 4

10.0

D3560043

ARM WELDMENT



Comment: Qty.: 1.0000 Each(s)/Unit Total: 5.0000 Each(s)

ARM WELDMENT

Batch: B32446

FF 07-06-07 4

11.0

MS20600AD4W5

Blind Rivet



Comment: Qty.: 36.0000 Each(s)/Unit Total: 180.0000 Each(s)

Blind Rivet

batch: 1209 = 34

SEE W/O CHANGE

FF 07-06-07 4

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries



Date: Thursday, 5/31/2007 7:23:16 AM

User: Kim Johnston

## Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: STEP WELDMENT

Job Number: 32718

Part Number: D3562041

Job Number:



Seq. #:

Machine Or Operation:

Description:

12.0

SMALL FAB 1

SMALL &amp; MEDIUM FAB RESOURCE 1



Comment: SMALL &amp; MEDIUM FAB RESOURCE 1

Rivet legs using Magnabond as per dwg D3562.

Ensure to wipe off any excess magnabond of the step



J.E. 07.06.13

4

A/R

Magnabond 6398

Batch:

M103628

J.E. 07.06.13

4

13.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

J.E. 14.07.13

Test Fitted on A.K.

14.0

LARGE FAB 1

LARGE FABRICATION RESOURCE 1



Comment: LARGE FABRICATION RESOURCE 1

1-Weld Remaining end cap as per Dwg D3562 &amp; QSI 004. Inspect for foreign objects as per QSI 024.

A/R Aluminum Rod

M102756

2-Grind end cap welds flush as per Dwg D3562

J.E. a.m.

07.06.14

4

15.0

QC9

VISUAL WELDING INSPECTION



Comment: VISUAL WELDING INSPECTION

LH

07/06/15

(4)

16.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

J.E. 14.07.13

LH

17.0

POWDER COATING

POWDER COATING



Comment: POWDER COATING

Powder Coat White Gloss (Ref: 4.3.5.1) as per QSI 005 4.3

M 104144

BR.

07.06.15

(4)

18.0

HAND FINISHING1

HAND FINISHING RESOURCE #1



Comment: HAND FINISHING RESOURCE #1

Wing Walk as per Dwg D3562 and QSI 005 4.4

Batch:

M104281

M-h

07/06/15

(4X)

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	
07.06.07	195	<del>PRESS FIT D2808 SPACER AFTER POWDER COAT</del> B/N _____ N/A done on 27/07/07 see D3560-041/043				J.06.07 JEV Q51042	J.06.07 JEV	

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes ☐ No ☒ DQA: ☒ Date: 07/06/07  
 QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries



Date: Thursday, 5/31/2007 7:23:16 AM

User: -- Kim Johnston

## Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: STEP WELDMENT

Job Number: 32718

Part Number: D3562041

Job Number:



Seq. #:

Machine Or Operation:

Description :

19.0

QC3

INSPECT POWDER COAT/CHEMICAL CONVERSION



Comment: INSPECT POWDER COAT/CHEMICAL CONVERSION

*C 4/6/15 (2)*

20.0

PACKAGING 1

PACKAGING RESOURCE #1



*\* SEE W/D CHANGE FOR STEP 19.5*



Comment: PACKAGING RESOURCE #1

Pick Assembly Kit

*C 7/6/15 59 (2)*  
*Inspection Wk release 07/06/15*

Job Completion



*QC 21 FINAL*

**POSITIVE RECALL**

EFFECTIVE \_\_\_\_\_ AUTH \_\_\_\_\_

RELEASED *U* \_\_\_\_\_ DATE *07-06-15*

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries



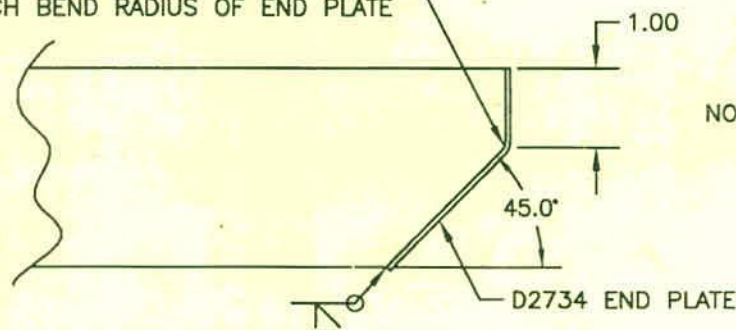
**DART**

RELEASED

07.01.2008

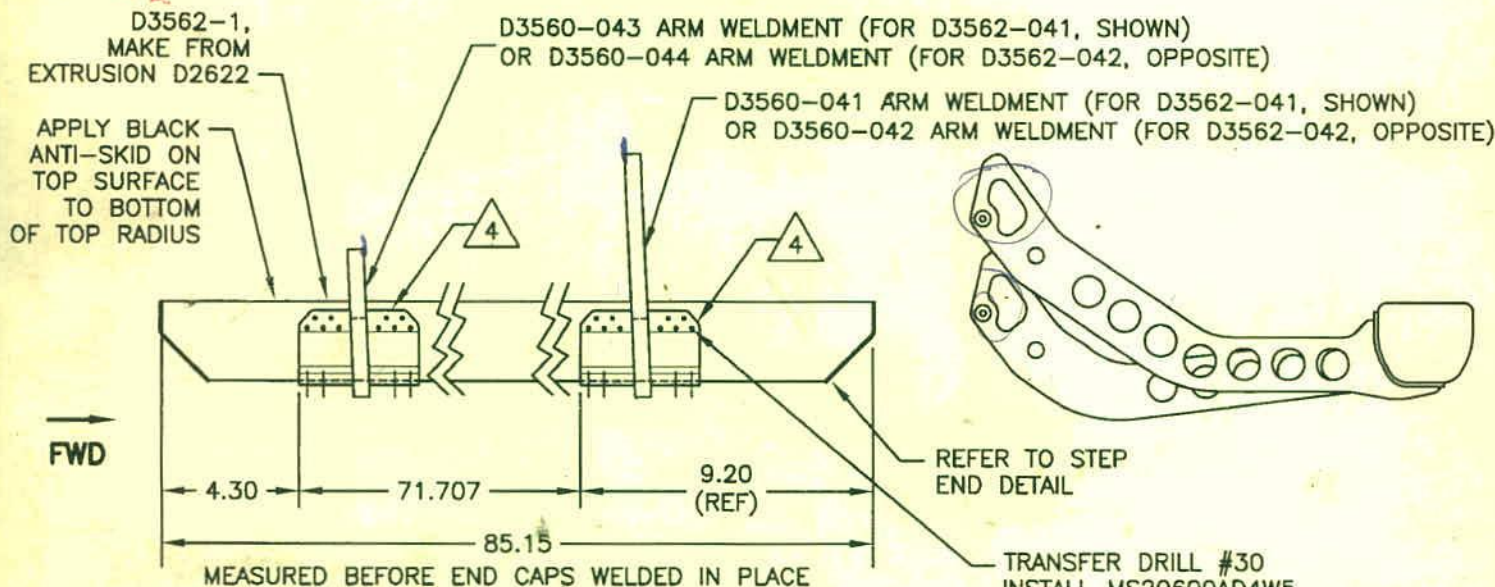
NOTE: ALL WELDS SHALL BE 100% VISUALLY INSPECTED BY A QUALIFIED INSPECTOR PER DART QSI 004

ROUND CORNER OF EXTRUSION TO MATCH BEND RADIUS OF END PLATE



**TYPICAL STEP END DETAIL**  
NOT TO SCALE

SHOP COPY  
RETURN TO  
ENGINEERING  
UNCONTROLLED COPY  
SUBJECT TO AMENDMENT  
WITHOUT NOTICE  
WORK ORDER  
NO. 32718



**D3562-041 LH STEP ASSEMBLY (SHOWN)**  
**D3562-042 RH STEP ASSEMBLY (OPPOSITE)**

- 1) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED
- 2) WELD PER DART QSI 004
- 3) FINISH:

AFTER WELDING END PLATES AND PRIOR TO DRILLING/INSTALLING ARM WELDMENTS:

- i) CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
  - ii) POWDER COAT GLOSS WHITE (4.3.5.1) OR GREY SANDTEX (4.3.5.6)  
OR BLACK SANDTEX (4.3.5.7) OR GREEN SANDTEX (4.3.5.8) PER DART QSI 005 4.3
  - iii) BLACK ANTI-SKID PAINT PER DART QSI 005 4.4
- 4) INSTALL ARM WELDMENTS WITH A LAYER OF SIKAFLEX-2417-291 OR PROSEAL 890 OR MIL-S-8802 CLASS-B2 SEALANT BETWEEN THE ARM WELDMENT AND STEP EXTRUSION
  - 5) ALL DIMENSIONS ARE IN INCHES

MAGNABOND  
07.06.07

REF IS EMAIL

DESIGN	DRAWN BY	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA
CP	CP	
CHECKED	APPROVED	DRAWING NO.
CP	CP	D3562
DATE	TITLE	SCALE
07.01.15	STEP ASSEMBLY	NTS
REV.	DATE	DESCRIPTION
A	06.09.26	NEW ISSUE
B	07.01.15	ARMS NOW RIVETED TO STEP

THE  
LIBRARY OF THE  
MUSEUM OF  
COMPARATIVE ZOOLOGY  
AT HARVARD UNIVERSITY  
CAMBRIDGE, MASS.



**Chris Provencal**

---

**From:** David Shepherd [dshepherd@dartaero.com]  
**Sent:** June 5, 2007 5:18 PM  
**To:** 'Chris Provencal'  
**Subject:** RE: D3562-041/-042

As we have discussed previously, this is acceptable as long as the Magnabond doesn't break down.

David

---

**From:** Chris Provencal [mailto:cprovencal@dartaero.com]  
**Sent:** Tuesday, June 05, 2007 11:00 AM  
**To:** David Shepherd (David Shepherd)  
**Subject:** D3562-041/-042

David

For the D3562-041/-042 step weldment, as discussed. They want to switch from Sikaflex to Magnabond, and powder coat after final assembly.

As part of this change, the D3560-XX arms won't be powder coated, and the D2808 Bushing won't be assembled until after final assembly of the step weldment.

Since this is the first time trying this, we will ensure that the steps are checked after powdercoating in case the Magnabond doesn't do anything unexpected (eg. bubbling). If we see anything suspect, we will assemble them the old way.

Is this acceptable.

-Chris

No virus found in this incoming message.  
Checked by AVG Free Edition.  
Version: 7.5.472 / Virus Database: 269.8.9/834 - Release Date: 6/5/2007 2:38 PM

No virus found in this outgoing message.  
Checked by AVG Free Edition.  
Version: 7.5.472 / Virus Database: 269.8.9/834 - Release Date: 6/5/2007 2:38 PM





**Chris Provencal**

**From:** David Shepherd [dshepherd@dartaero.com]  
**Sent:** June 5, 2007 12:26 PM  
**To:** 'Chris Provencal'  
**Subject:** RE: D3560-041/-042/-043/-044

Go ahead.

David

---

**From:** Chris Provencal [mailto:cprovencal@dartaero.com]  
**Sent:** Tuesday, June 05, 2007 9:55 AM  
**To:** David Shepherd (David Shepherd)  
**Subject:** D3560-041/-042/-043/-044

David,

This is sort of a rush: dwg D3560 Rev.B (step weldment for -033/-034 steps) is not calling up the D2808 Bushing. It is missing the "Press fit D2808 Bushing after powder coat".

We will correct this, but for the time being: is it acceptable to press fit a D2808 Bushing into the D3560-041/-042/-043/-044 as the design originally intended?

-Chris

No virus found in this incoming message.  
Checked by AVG Free Edition.  
Version: 7.5.472 / Virus Database: 269.8.9/834 - Release Date: 6/5/2007 2:38 PM

No virus found in this outgoing message.  
Checked by AVG Free Edition.  
Version: 7.5.472 / Virus Database: 269.8.9/834 - Release Date: 6/5/2007 2:38 PM





## Chris Provencal

---

**From:** David Shepherd [dshepherd@dartaero.com]  
**Sent:** June 7, 2007 3:37 PM  
**To:** 'Chris Provencal'  
**Subject:** RE: D3562-041/-042

As we discussed, I think this change is acceptable without further qualification.

David

---

**From:** Chris Provencal [mailto:cprovencal@dartaero.com]  
**Sent:** Thursday, June 07, 2007 1:15 PM  
**To:** David Shepherd (David Shepherd)  
**Subject:** D3562-041/-042

David,

For the D3562-041/-042 Step Assembly, we need to remove qty(1) rivet from each D3560-XX Arm weldments attachments for manufacturability. There will be a total qty(34) MS20600AD4 rivets instead of qty(36) per step. The rivet will be removed from the side surface of the step. Remaining shear would be 350 lbs x 16 rivets = 5600 lbs per arm attachments.

-Chris

No virus found in this incoming message.  
Checked by AVG Free Edition.  
Version: 7.5.472 / Virus Database: 269.8.11/838 - Release Date: 6/7/2007 2:21 PM

No virus found in this outgoing message.  
Checked by AVG Free Edition.  
Version: 7.5.472 / Virus Database: 269.8.11/838 - Release Date: 6/7/2007 2:21 PM

